

REMARKS

The Applicant thanks the Examiner for the thorough consideration given the present application. Claims 2, 4, 9, and 13 are cancelled herein without prejudice to or disclaimer of the subject matter set forth therein. Claims 1, 3, 5-8, 10-12, and 14-19 are pending. Claims 10-12 are withdrawn. Claims 1, 3, and 8 are amended, and claims 16-19 are added. Claim 1 is independent. The Examiner is respectfully requested to reconsider the rejections in view of the amendments and remarks set forth herein.

Allowable Subject Matter

The Examiner states that claims 14 and 15 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Applicants appreciate the Examiner's early indication of allowable subject matter. As indicated above, rather than rewriting either of objected to claims 14 and 15 in independent form at this time, instead, independent claim 1 is amended herein to recite a novel combination of elements not suggested by the reference cited by the Examiner.

Therefore, independent claim 1 is in condition for allowance.

Election Requirement

The Examiner has made the Restriction Requirement final and has withdrawn claims 10-13 from consideration. Claim 13 has been cancelled by this Amendment. Assuming

independent claim 1 is found to be allowable, it is respectfully requested that the Examiner also consider and allow withdrawn claims 10-12.

If the Examiner persists in this Restriction Requirement, the Applicant reserves the right to file one or more divisional applications at a later date if so desired.

Rejection Under 35 U.S.C. § 112, second paragraph

Claim 8 stands rejected under 35 U.S.C. § 112, second paragraph. This rejection is respectfully traversed. The Examiner has set forth certain instances wherein the claim language lacks antecedent basis. In order to overcome this rejection, the Applicant has amended claims 1 and 8 to address the issue pointed out by the Examiner. The Applicant respectfully submits that the claims, as amended, particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Rejections Under 35 U.S.C. §102(b) and §103(a)

Claims 1-5 stand rejected under 35 U.S.C. §102(b) as being anticipated by Kawajiri et al. (JP 2002-134729); and claims 6-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kawajiri et al. in view of Miida (U.S. 6,476,371). This rejection is respectfully traversed.

Arguments Regarding Independent Claim 1

While not conceding the appropriateness of the Examiner rejection, but merely to advance the prosecution of the present application, independent claim 1 has been amended to recite a combination of elements directed to a solid-state imaging device, including *inter alia*

a first charge eliminating region formed between the substrate and the charge accumulation region, the first charge eliminating region forming a second potential barrier to the charges in the charge generating region, the second potential barrier being removable according to an applied voltage to the first charge eliminating region, and

when the first and second potential barriers are removed, the charges which have been accumulated in the charge generating region are eliminated to the substrate through the charge accumulation region before starting accumulation of the charges in the charge generating region, and then upon formation of at least the second potential barrier, the charges start to be generated by light irradiation to the charge generating region, to accumulate the charges in the charge accumulation region, and

wherein formation of the first potential barrier after a predetermined time of the light irradiation prevents the charges that are generated by the light irradiation to the charge generating region from being transferred to the charge accumulation region, and then causes a signal potential that changes in accordance with the amount of the charges in the charge accumulation region to be generated as an image signal.

The Applicant respectfully submits that the combination of features set forth in dependent claim 1 is not disclosed or made obvious by the prior art of record, including Kawajiri et al.

Kawajiri et al.

With the Kawajiri et al. device, before starting the accumulation of the charges in the charge generating region, the device removes the third potential barrier and eliminates the charges accumulated in the charge generating region. Namely, the third potential in 32a is removed with regard to the charge generating region 15a (the potential in 32a is higher than the charge generating region 15a) as shown in Figs. 5(b), 6(a)-(c), 14(c)-(d) and 15(b) by applying the voltage to the electrode 42 (42a, 42b) in Figs. 1-2, 7-11 and 16.

The Present Invention

In contrast to the Kawajiri et al. device, the device of the present invention is adapted to eliminate the charges through the light receiving section, the charge transfer region (removing the first potential barrier), the charge accumulation region, and the substrate in this order, and also to transfer the signal charges through the light receiving section, the charge transfer region (removing the first potential barrier) and the charge accumulation region in this order. In addition, in the present invention, the third potential barrier is set

lower than the first potential barrier and merely functions as a so-called overflow drain which eliminates the charges overflowed from the charge generating region.

At least for the reasons described above, the Applicant respectfully submits that the combination of features set forth in dependent claim 1 is not disclosed or made obvious by the prior art of record, including Kawajiri et al.

Dependent Claims

The Examiner will note that dependent claims 3, 8, and 10 have been amended, and that dependent claims 16-19 have been added to set forth additional novel features of the present invention.

All dependent claims are in condition for allowance due to their dependency from allowable independent claims, or due to the additional novel features set forth therein.

All claims of the present application are in condition for allowance. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. §102(b) and §103(a) are respectfully requested.

CONCLUSION

Since the remaining patents cited by the Examiner have not been utilized to reject claims, but merely to show the state of the art, no comment need be made with respect thereto.


All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. It is believed that a full and complete response has been made to the outstanding Office Action, and that the present application is in condition for allowance.

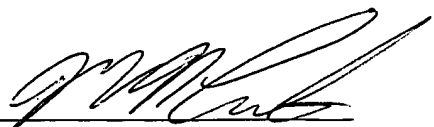
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, he is invited to telephone Carl T. Thomsen (Reg. No. 50,786) at (703) 205-8000.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly extension of time fees.

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Respectfully submitted,

MRC/CTT/af 

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